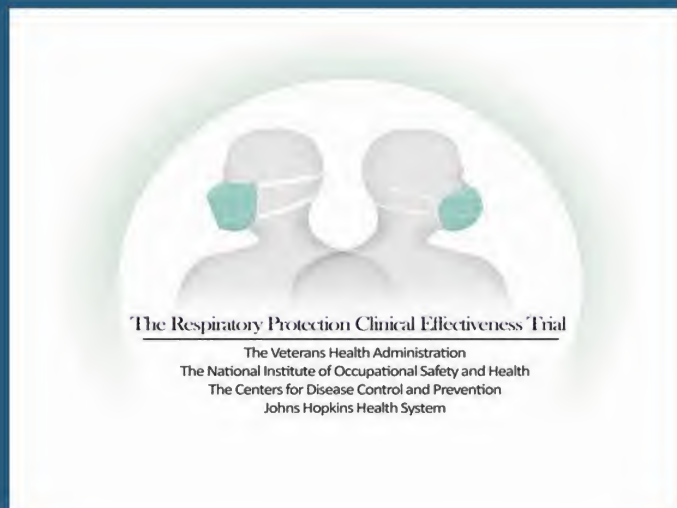
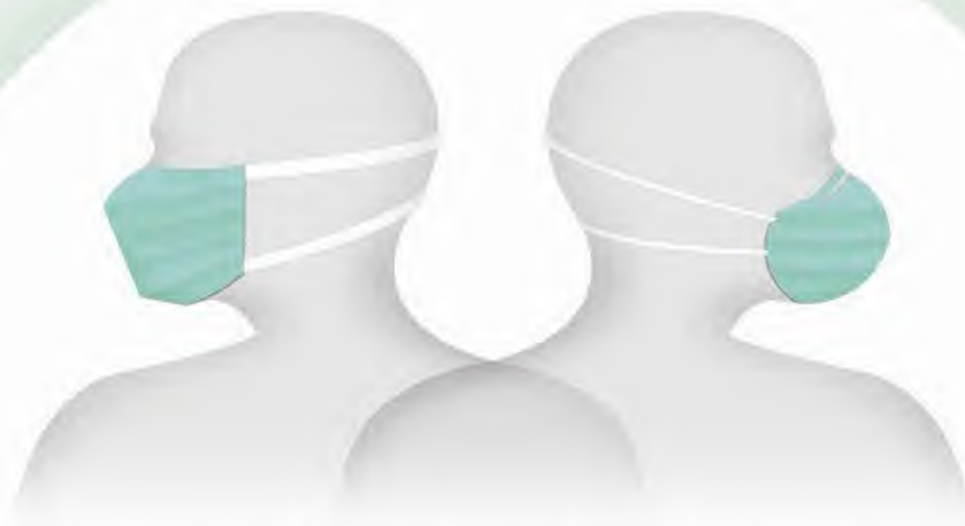


# ResPECT Study

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# The Respiratory Protection Clinical Effectiveness Trial

The Veterans Health Administration  
The National Institute of Occupational Safety and Health  
The Centers for Disease Control and Prevention  
Johns Hopkins Health System

**Principle investigators:**  
Lew Radonovich and Trish Perl

**Co Investigators:**

Mary Bessensen, Derek Cummings, Charlotte Gaydos, Cynthia Gibert, Justin Lessler, Chris Nyquist, Connie Price, Nick Reich, Maria Rodriguez-Barrados, & Mike Simberkoff

**Sponsors:**

CDC (NIOSH, DHQP-Ron Shaffer, Ed Fischer, Mike Bell) & The Veterans Health Administration



## Universities

Johns Hopkins University

University of Massachusetts

University of Colorado

VA: NY, Washington DC and Houston

## Scientific Advisory Board

Daniel Morgan, Arnold Monto, Kristin Nichols,  
Richard P. Wenzel

## DSMB:

Allison McGeer, Elizabeth Johnson, Tia Powell

# Background

- Respiratory infections are common among HCPs
- Transmission thought to be primarily via large droplets, airborne hypothesized by some and contact increasingly recognized as important
- Appropriate level of respiratory protection has been disputed with
  - H1N1
  - SARS
  - MERS-CoV
  - H7N9
  - Other emerging respiratory viruses

# Key Objectives & Questions

- Determine the incidence of influenza & other respiratory viral pathogens causing symptomatic and asymptomatic infections among HCWs in outpatient settings
- Determine the magnitude of reduction of influenza & respiratory infections in HCPs wearing masks and N95 respirators

# Design

- Primary outcome-respiratory RT-PCR confirmed respiratory virus infection or serologic evidence of infection
- Two arms
- Designed to detect an effect in four-five years
  - Assumed cumulative incidence of LC respiratory viruses among usual precautions group-10%
  - Effect size-25% reduction in cumulative incidence between the surgical mask and N95 group compared to usual precautions

# Comparison

- 2007 CDC Respiratory Protection Guidelines for Flu (**Medical Masks**)



- 2009 CDC Respiratory Protection Guidelines for Flu (**N95 Respirators**)



# Hypothesis

- The incidence of RT-PCR confirmed respiratory virus infection will be at least lower among health care personnel working in outpatient settings and wearing N95 respirators than those wearing surgical masks exposed to patients with respiratory viral infections

# Methods

- Study with a prospective timeline, non-blinded, cluster randomized interventions, a two-arm, “head-to-head” comparison, multiple sites and multiple geographic locations, with longitudinal cohorts recruited for multiple years
- Will be conducted in outpatient clinics, emergency departments and/or urgent care settings in multiple geographic locations
- Subjects will be recruited and randomized to one of two study arms, medical masks or N95 Respirators
- The duration of the intervention (mask wearing) period of the study is dependent on surveillance and incidence of viral respiratory illness at each site, but it is not expected to extend longer than 16 weeks

## Methods, cont.

- During the pre-study period, demographic information (baseline survey), knowledge, attitudes, and beliefs regarding FPE will be administered, a blood sample will be collected for baseline serology testing, and subjects educated about the study, including the fit testing process
- Weeks 1-16 are the 'intervention period'. A cluster-randomized design will be utilized such that a group ("cluster") of approximately 16 people will be assigned (randomized) to wear the same device (Mask or N95) for up to 16

## Methods, cont.

- Participants will also be asked to provide upper respiratory specimen during the intervention period
- The research team will also observe participants' adherence to mask use and hand hygiene
- Two weeks after the final week of wearing FPE (post-study period), subjects will be asked to provide a final serological sample and to complete a post-study survey

# Cluster-Randomized Trial

- Unit of randomization is the “cluster”, not the individual
  - Cluster = clinic/ward/department
- Why CRT?
  - Basic feasibility considerations
  - Mass education
  - Reduces inter-group “contamination”
  - “Clustering effect”

# Setting

- Outpatient clinics
  - Emergency Departments
  - General Medicine and Pediatrics clinics
  - Family Medicine clinics
- Includes adult and pediatrics
- JHHS
- Denver Health, Denver Children's and Denver VA
- NY (manhattan) VA
- Houston VA
- Washington VA

# Timeline

- 2010-1: Pilot Johns Hopkins University (Johns Hopkins Health System) sites
- 2011-2: 3 sites activated:
  - JHU (site PI: TM Perl)
  - University of Colorado—Denver Health (site PI: CS Price)
  - VA Manhattan (site PI: M Simberkoff)
- 2012-3: Added 4 additional sites:
  - VA Hospital sites
    - Washington DC (site PI: C Gibert)
    - Houston, TX (site PI: MC Rodriguez-Barradas)
    - Denver, CO (site PI: M Bessesen)
  - University of Colorado Children's Hospital (site PI: AC Nyquist)

# Procedures

- Clinic site randomized (clusters within each site)
- Study Briefing
- Collect Baseline Information
  - Demographic
  - Recent health history
    - Possible exclusion
    - Recent flu symptoms
  - Exposure
  - Household/family information
  - Flu Vaccination history
- Obtain Blood Sample
- N95 Fit Testing if needed

## Weeks 2-13

- **Wear Assigned PPE for exposure to patients with respiratory symptoms**
  - Compliance monitored
    - weekly by research staff
    - self reported diary
- **Daily and Weekly Symptom Diaries**
  - Electronic, web-based collection
- **Daily Exposure assessment**
- **Daily Patient Roster/Complexity Classification**

# Daily and Weekly Diaries

- **Daily**
  - Monitor signs and symptoms of flu
    - Fever
    - Shortness of breath/upper respiratory symptoms
    - Other flu-like symptoms
  - Call in if Fever + Cough or Sore Throat
- **Weekly**
  - Risk Factor Assessment
    - Use of nasal sprays or ointments
    - Recent problems with allergies
    - Use of immune suppressing drugs
    - Symptoms of others in household
- Paper and/or web-based

# Symptoms Procedure

- **Fever + Cough or Sore Throat**
  - Greater than 37.8° C or 100.1° F
- **Nasopharyngeal Swab or Aspirate**
  - Two samples
- **Coordinate with Local Occupational Health and Follow Clinic/Hospital Furlough Policy**

# Completion of Study

- **Blood Serology**
  - Test for antibodies to.....

# Planned Outcomes

- Primary outcome variable: Viral Respiratory Incidence
  - Rates of participant infection with influenza between study arms – N95, surgical masks, and “usual protection”
- Secondary outcomes
  - Incidence of influenza and other respiratory virus infections
  - Comparison of influenza rates based on self-reported symptoms & clinical criteria with influenza rates detected by serology
  - Comparison of detection by NP swab vs. serology
  - Comparison of PPE's effects on productivity

# Sample Size Calculation

- In an effort to maximize compliance and ensure generalizability, the investigators have selected a cluster randomization in which all subjects on the same clinical unit are outfitted with the same type of protective devices. Although the model of N95 may vary at each study site and within each cluster, the type of respirator will not change
- Selection of clinic sites will be based on the size of the clinic. Each cluster/clinic will have a median of 20 HCPs
- Selection of clinic sites will also be based, in part, on the interest-level and enthusiasm of the HCP-subjects and the numbers of patients who present for healthcare with a diagnosable respiratory illness

# Lab Methods

- ***Respiratory Pathogen Identification***
  - Swab specimens designated for processing within 10 days will be processed and stored at JHU. Frozen samples will be sent to Johns Hopkins University at agreed upon intervals
- ***Nucleic Acid Extraction, PCR***
  - A multiplex PCR assay(s) at JHU will be used to identify human respiratory pathogens. Currently, we plan to process and store samples for further analysis until such a time that logistic and funding resources are made available.

# Main Protocol Differences

## Pilot

- 6 clusters
- Weekly nasopharyngeal swabs
- Weekly payments
- PPE/HH audits on paper (10 weekly)
- SurveyMonkey for diaries

## Year 1

- 53 clusters
- 2 randomized nasal & throat swabs with take-home kits
- 2 lump payments—  
incentivized
- PPE/HH audits via web-based program
- RedCap for surveys/diaries
- Extended enrollment period

## Year 2

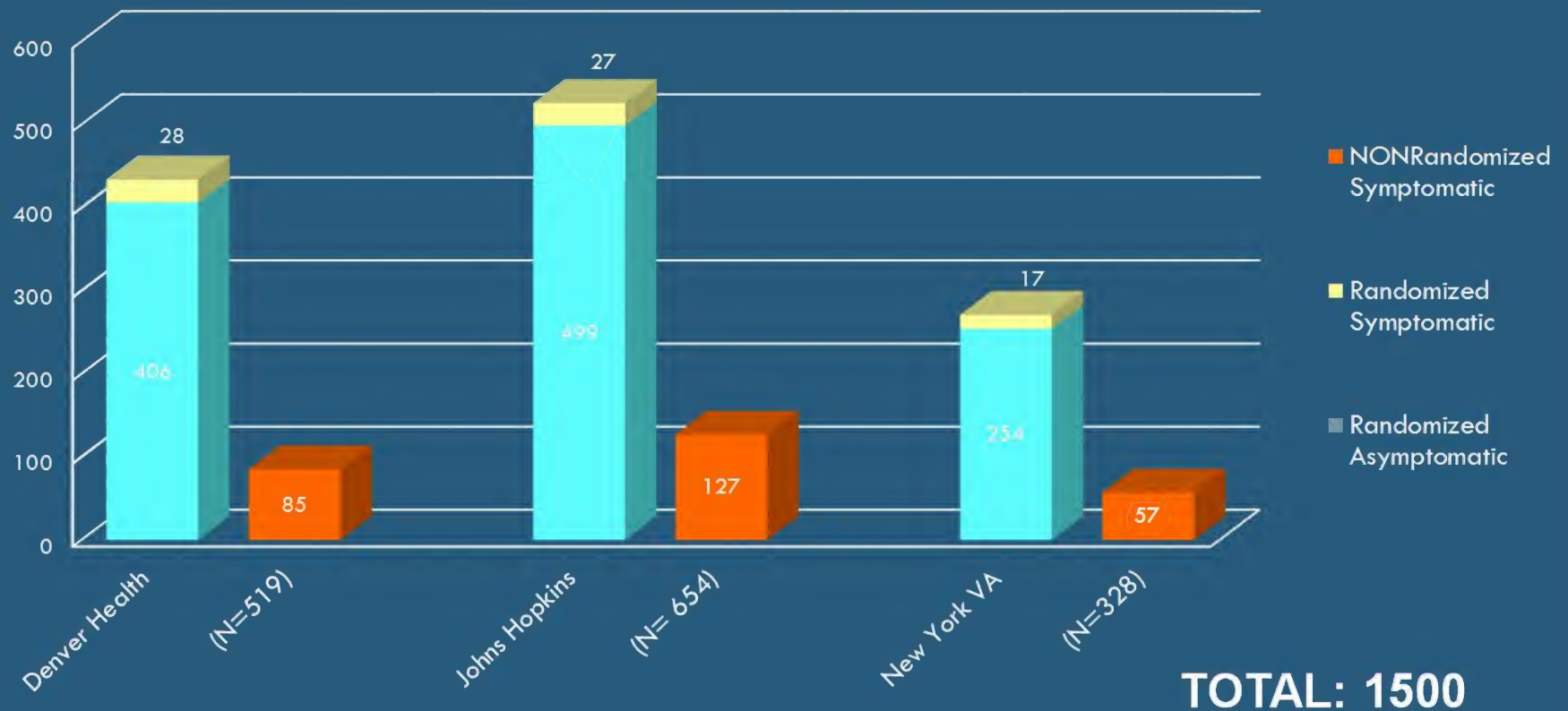
- 117 clusters
- 2 randomized nasal & throat swabs with take-home kits
- 2 lump payments—  
incentivized
- PPE/HH audits via web-based program
- Redcap for surveys/diaries

# Overview by Site

	Total Clusters	Total Enrolled	Total Withdrawn (to date)	Total Participants (after withdrawal)	Total Enrolled that received the vaccine	Total Symptomatic Swabs Performed	Total Asymptomatic Swabs Performed
	6	148	38 (26%)	110	59 (40%)	36	1083
	16	276	22 (8%)	254	225 (82%)	127	526
JHU – YEAR 2	21	438	47 (11%)	391	367 (84%)	95	690
	14	228	20 (9%)	208	225 (82%)	127	526
DENVER HEALTH – YR 2	20	275	22 (8%)	253	254 (93%)	149	533
COLORADO CHILDREN'S	2	48	2 (4%)	46	48 (100%)	41	93
DENVER VA	10	70	6 (9%)	64	50 (72%)	55	106
	23	153	6 (4%)	147	83 (54%)	51	238
NY VA-YR 2	20	151	16 (11%)	135	75 (53%)	94	290
DC VA	18	97	7 (7%)	90	55 (57%)	61	165
HOUSTON VA	8	106	8 (8%)	98	66 (62%)	64	123
<b>TOTALS [for YEAR 2]</b>	<b>99</b>	<b>1185</b>	<b>108 (9%)</b>	<b>1,077</b>	<b>1199</b>	<b>722</b>	<b>3609</b>

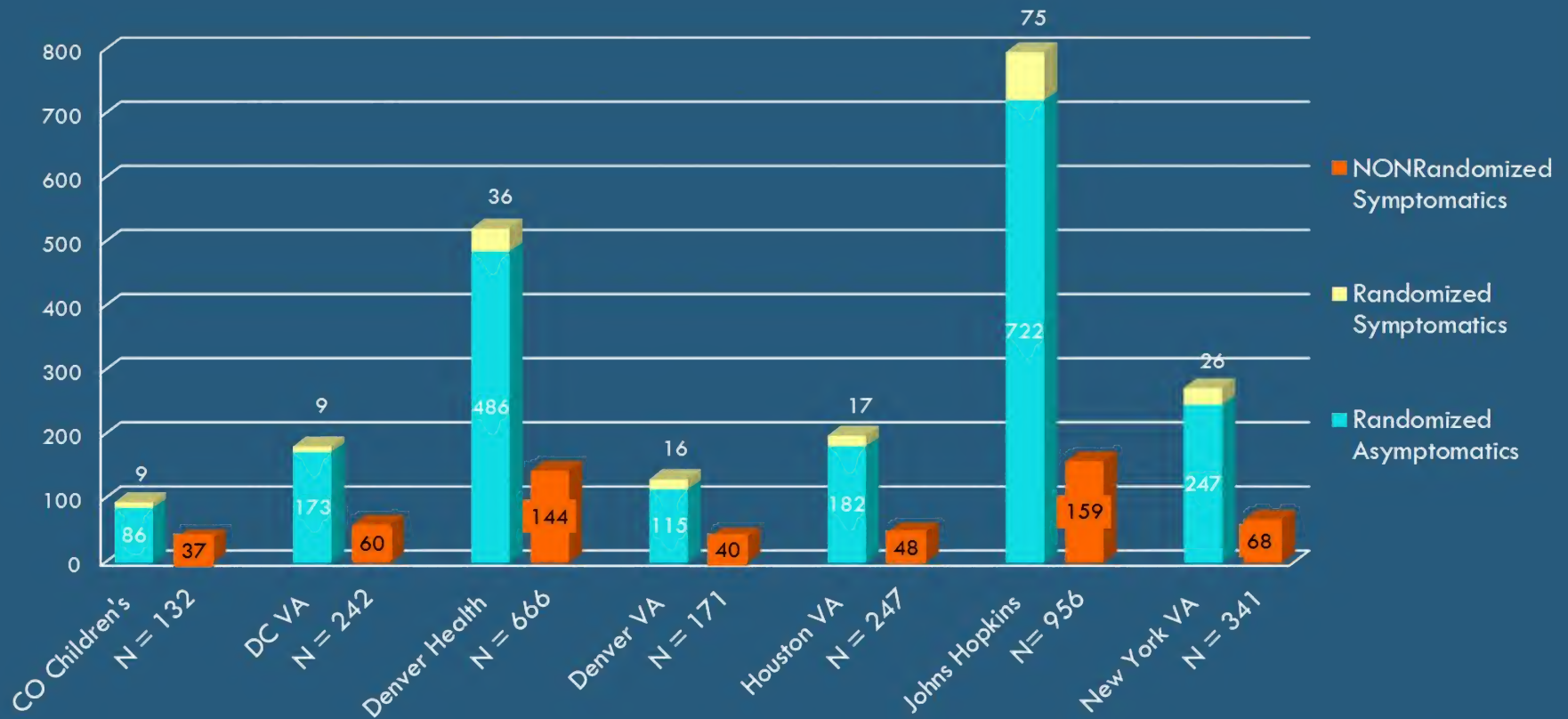
# ResPECT Swab Collection Year 1

Swab Collection by Site 2011-2



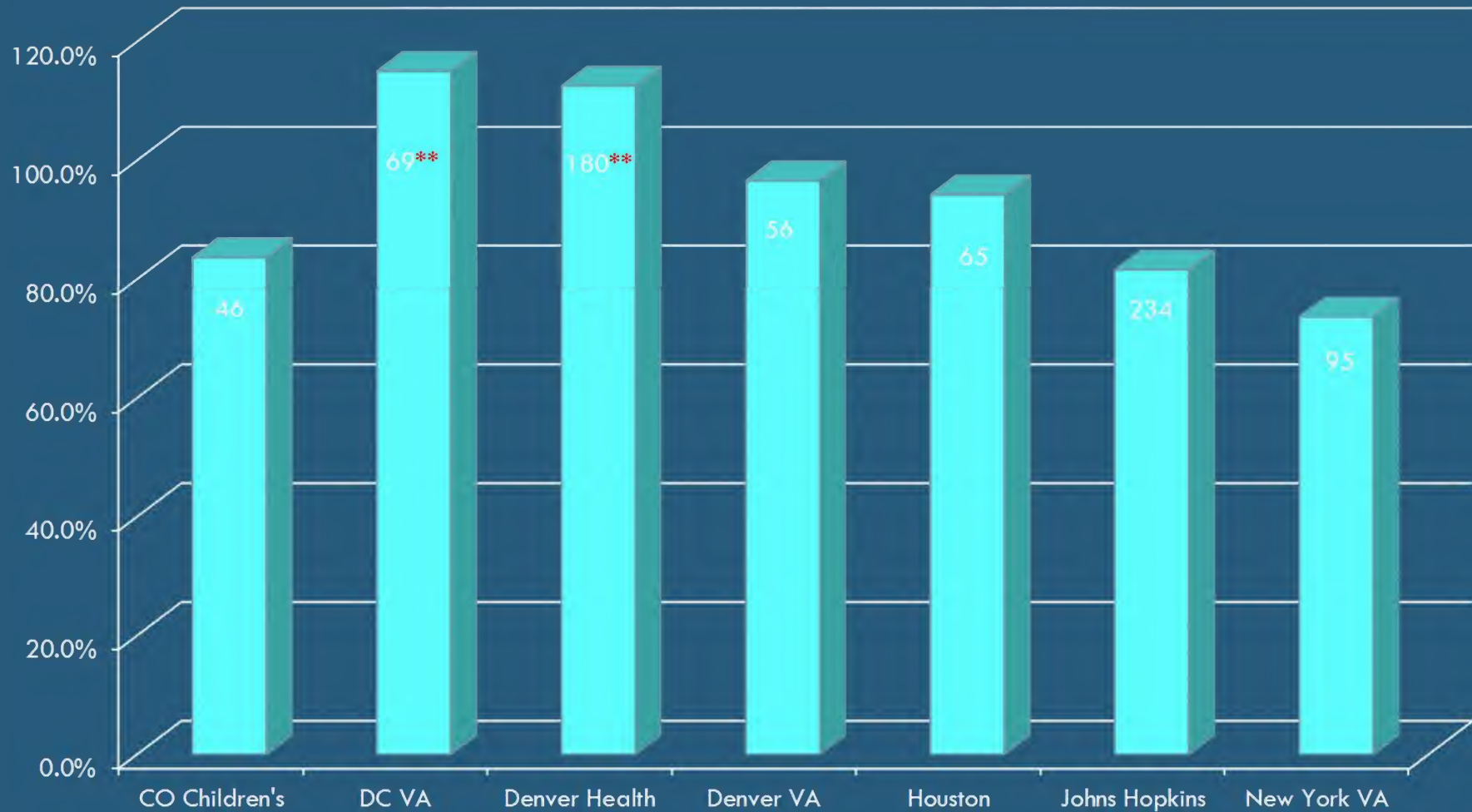
# Swab Collection Year 2

Swab Collection by Site 2012-3



**TOTAL: 2755**

## % Symptomatic Samples Collected\* 2012-3

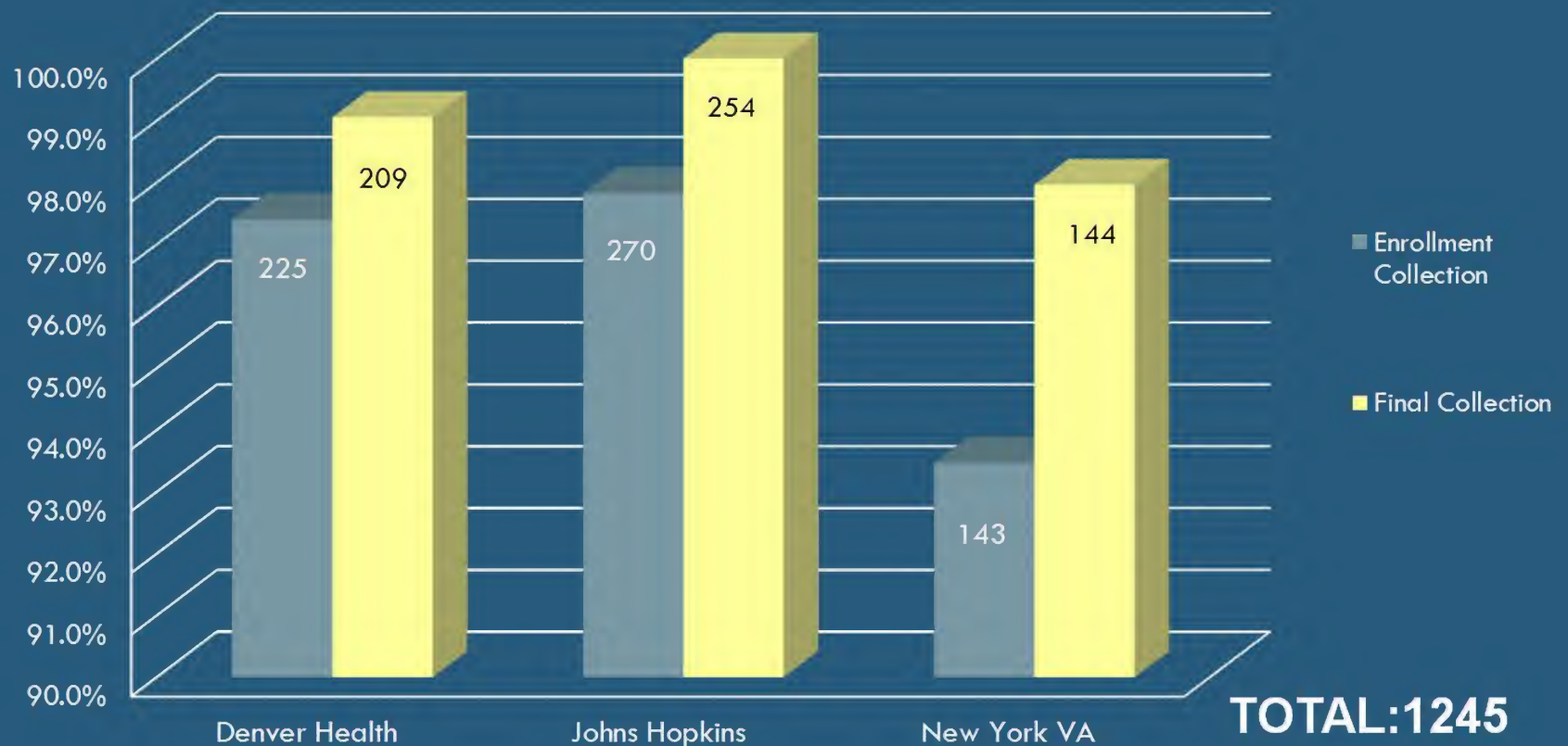


**\*Based on # Symptomatic Event  
Report Forms Submitted**

**\*\* Does not account for those that did  
not fill out SEF (e.g. called staff with  
symptoms).**

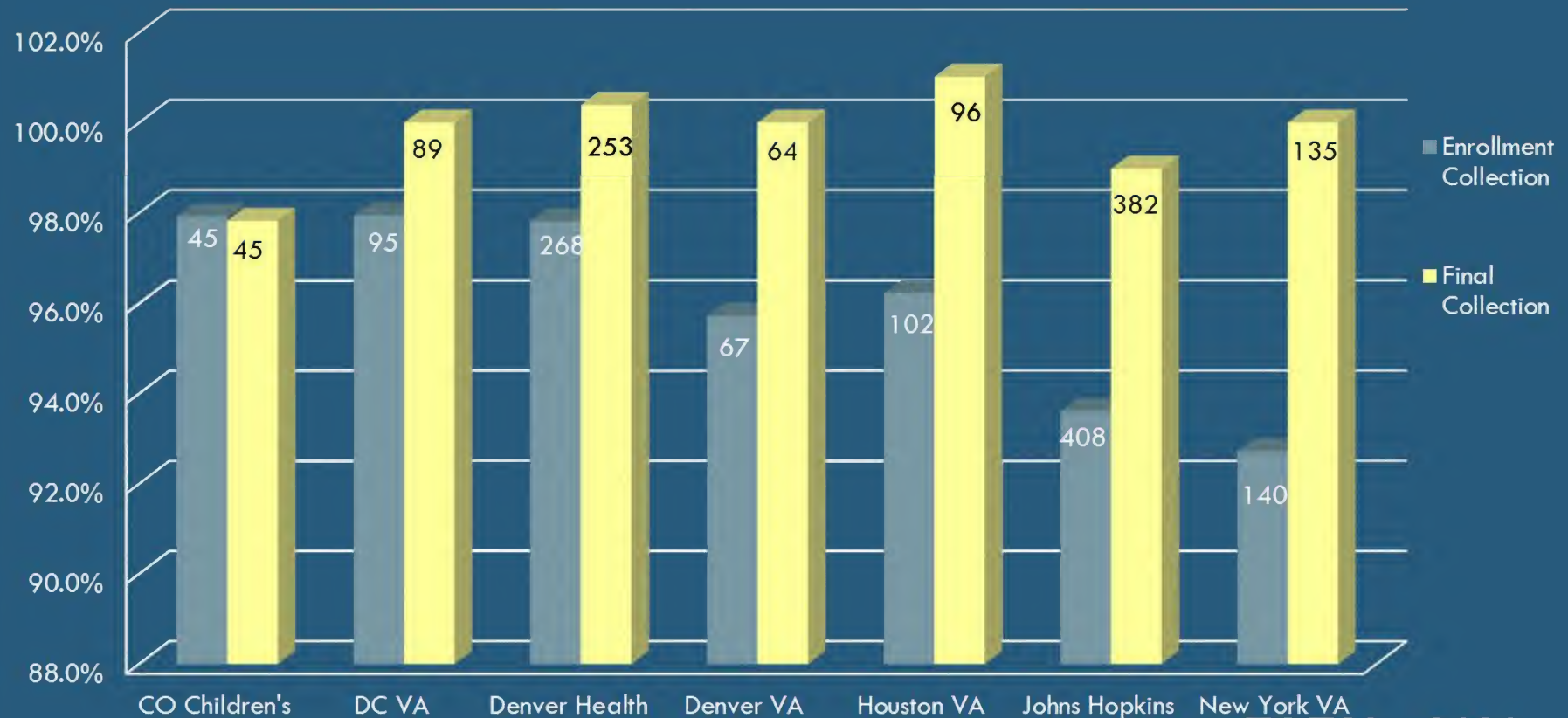
# Blood Draw Completion Year 1

## Blood Collection 2011-2



# Blood Draw Completion Year 2

## Blood Collection 2012-3



**TOTAL: 2189**

# Sample Testing Overview

N/P Swab samples  
tested to date:

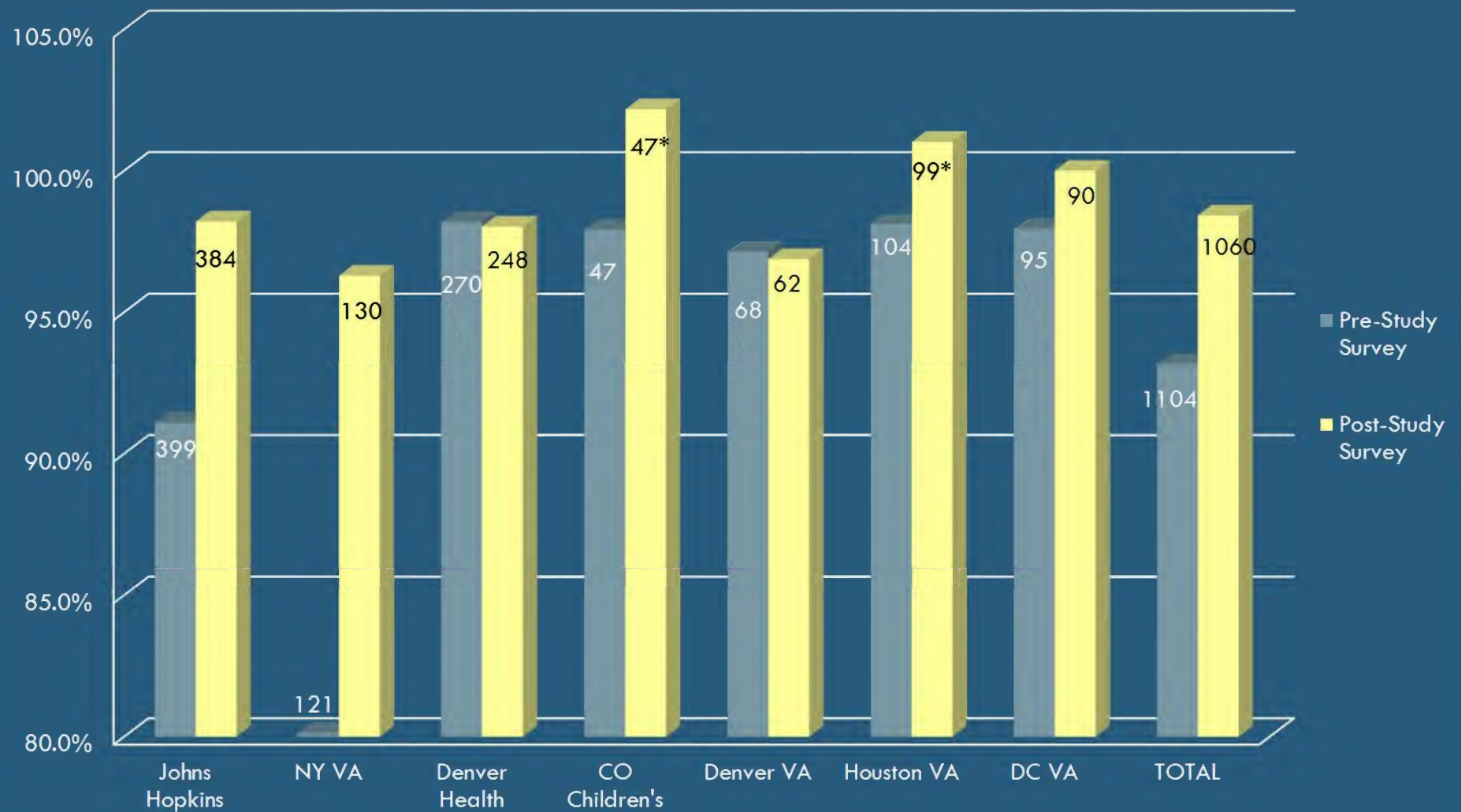
	Asymptomatic	Symptomatic	Total
Swabs YR1	1035	335	1370
Swabs YR2	<i>Not yet tested</i>	209	209
<b>Total</b>	<b>1035</b>	<b>544</b>	<b>1579</b>

Blood samples tested to date: **1292**

# Sample Testing Overview

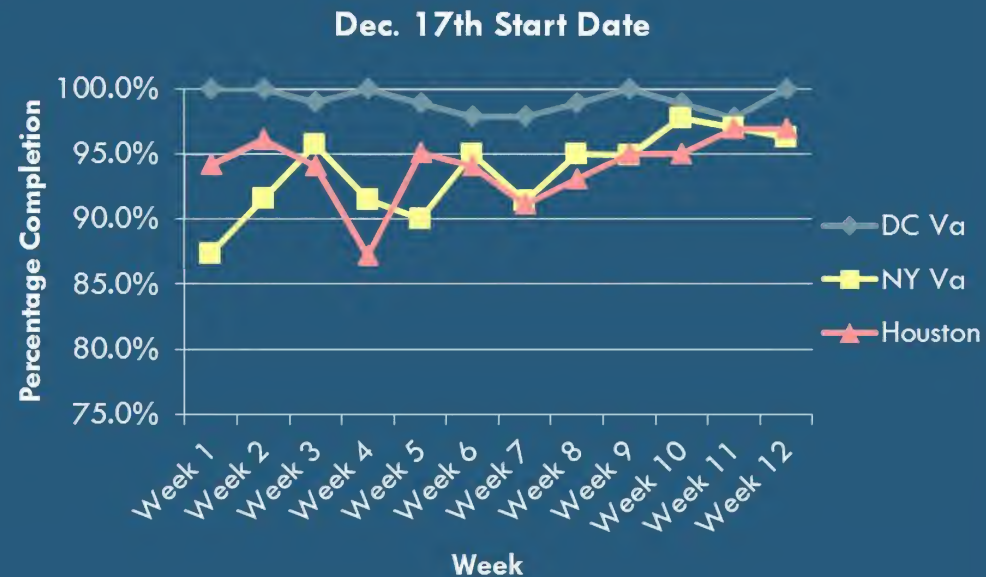
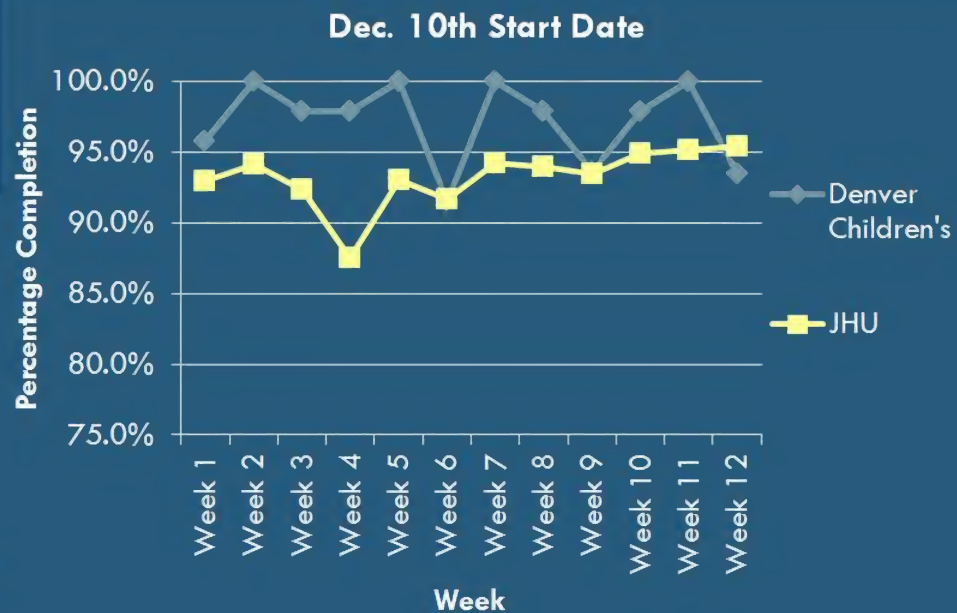
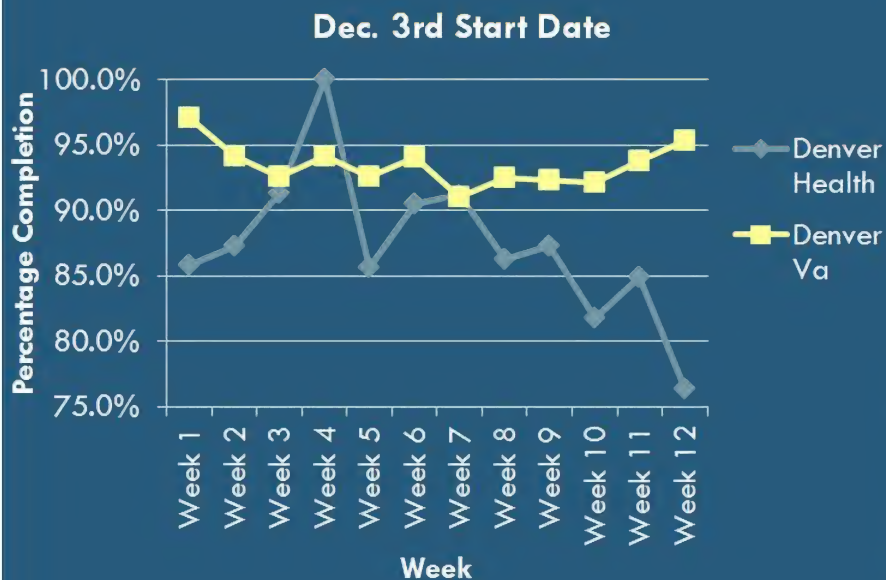
- Virus's isolated include
  - Influenza (A, B)
  - RSV
  - Rhinovirus
  - Coronavirus
  - Adenovirus
  - Parainfluenza
  - HMP

## Pre- and Post-Study Survey Completion by %



\* Surveys exceed 100% due to collecting surveys from withdrawn participants when able.

# Weekly Diary Performance



# Summary

- Successful cluster randomized clinical trial evaluating the efficacy of masks/respirators entering third year.
- Collaboration between CDC and VA
- Respiratory pathogens are primary outcomes
- Significant infrastructure built to support active surveillance in healthcare workers

Thank you: The ResPECT team

